CLAIMS

What is claimed is:

1   1.   A cable modem having a programmable media access controller, comprising:

2   a system bus;

3   a plurality of processors, each of the plurality of processors is communicatively coupled

4   to the system bus, that perform a plurality of processing functions, the plurality of processing

5   functions are partitioned, at least in part, between at least two of the plurality of processors;

6   a peripheral bus that is operable to perform transfer of cable media;

7   a bridge that communicatively couples the system bus and the peripheral bus; and

8   a peripheral processing device, communicatively coupled to the peripheral bus, that is

9   operable to perform processing of a selectively off-loaded portion of the cable media.

1   2.   The cable modem of claim 1, wherein one of the plurality of processors supports

2   upstream data transfer of cable media received by the cable modem; and

3   at least one other of the plurality of processors supports downstream data transfer of the

4   cable media transmitted by the cable modem.

1   3.   The cable modem of claim 1, wherein one of the plurality of processors is

2   operable to perform at least one of message processing and scheduling.

1   4.   The cable modem of claim 1, wherein the bridge comprises a direct memory

2   access controller that is operable selectively to provide a portion of the cable media to one of the

3   plurality of processors and to provide the off-loaded portion of the cable media to the peripheral

4   processing device.

1   5.   The cable modem of claim 1, further comprising at least one additional peripheral

2   processing device, communicatively coupled to the peripheral bus, that is operable to perform

3   processing of at least one additional selectively off-loaded portion of the cable media.

1   6.   The cable modem of claim 1, wherein the plurality of processing functions

2   comprises operating system functionality.

1   7.   The cable modem of claim 1, wherein the plurality of processing functions

2   comprises media access control functionality.

1   8.   The cable modem of claim 1, wherein one of the plurality of processors employs

2   embedded code to support media access control functionality.

1   9.   A cable modem device, comprising:

2   a bifurcated bus structure comprising a first bus and a second bus;

3   a partitioned processor structure, communicatively coupled to the first bus, comprising a

4   plurality of processors, that is operable to perform a plurality of processing functions;

5   a co-processor, communicatively coupled to the second bus, that is operable to support

6   processing of cable media that is selectively off-loaded from at least one of the plurality of

7   processors;

8   an input/output interface, communicatively coupled to the second bus, that is operable to

9   perform data transfer of a plurality of data to the second bus; and

10   a direct memory access controller that communicatively couples the first bus and the

11   second bus and that is operable to support off-loading of at least one function of the plurality of

12   functions to the co-processor.

1   10.   The cable modem device of claim 9, further comprising at least one additional co-

2   processor, communicatively coupled to the second bus, that is also operable to support

3   processing of cable media that is selectively off-loaded from at least one of the plurality of

4   processors.

1   11.   The cable modem device of claim 9, wherein the first bus employs an Advanced

2   System Bus protocol; and

3   the second bus employs an Advanced Peripheral Bus protocol.

1   12.   The cable modem device of claim 9, wherein one of the plurality of processors

2   supports upstream data transfer of cable media received by the cable modem; and

3   at least one other of the plurality of processors supports downstream data transfer of the

4   cable media transmitted by the cable modem.

1   13.   The cable modem device of claim 9, wherein the co-processor is operable to

2   perform at least one of DES encryption and DES decryption.

1   14.   The cable modem device of claim 9, wherein the plurality of processing functions

2   comprises operating system functionality and media access control functionality.

1   15.   The cable modem device of claim 9, wherein the second bus operates consuming

2   power at a rate lower than a rate at which the first bus consumes power.

1   16.   The cable modem device of claim 9 manufactured as an integrated circuit.

1   17.   A method to perform processing within a cable modem, the method comprising:

2   performing cable media processing using a plurality of processors, the cable media

3   processing is partitioned, at least in part, between at least two of the plurality of processors;

4   selectively off-loading a portion of the cable media from at least one of the plurality of

5   processors to a co-processor; and

6   processing the off-loaded portion of the cable media using the co-processor.

1   18.   The method of claim 17, wherein the method is performed within an integrated

2   circuit.

1   19.   The method of claim 17, wherein at least one of the plurality of processors

2   comprises embedded code that is substantially operable for media access control functionality.

1   20.   The method of claim 17, further comprising directing upstream and downstream

2   communications of cable media using at least two of the plurality of processors.